

1 What is claimed is:

2
3 1. A powered reciprocating table saw, comprising:

4 a work table, having first and second sides, for supporting a workpiece on the first side of the
5 work table and having a mounting plate disposed proximate an intermediate location of the work table
6 wherein a first surface of the mounting plate is coplanar with the first side of the work table;

7 a saw motor oriented vertically and supported beneath the work table from a second surface
8 of the mounting plate, the saw motor having a housing, a reciprocating output shaft extending upward
9 from the housing, and blade clamping means disposed on the distal end of the reciprocating output
10 shaft; and

11 an elongated saw blade having first and second ends, retained at the first end in the blade
12 clamping means of the saw motor and positioned to pass through and move reciprocatingly along an
13 axis of reciprocation within a blade opening approximately centrally disposed in the mounting plate
14 of the work table wherein the saw blade extends upward and substantially beyond the first side of the
15 work table for cutting the workpiece during operation.

16
17 2. The table saw of claim 1, further comprising:

18 a motor mount disposed between and attached to the saw motor housing and the second
19 surface of the mounting plate for supporting the saw motor from the second surface of the mounting
20 plate wherein the axis of reciprocation of the output shaft is aligned with the blade opening in the
21 mounting plate and disposed at an angle of approximately four degrees from normal to the first side
22 of the work table.

23
24 3. The table saw of claim 2, wherein the angle of the axis of reciprocation may vary within
25 the range defined by an angle of four degrees from normal to the first side of the work table, within
26 a range of plus or minus four degrees.

1 4. The table saw of claim 2, wherein the angle of reciprocation may be adjustable within the
2 range of plus or minus four degrees relative to approximately four degrees from normal to the first
3 side of the work table.

4
5 5. The table saw of claim 1, further comprising:
6 a blade guide assembly supported by means attached to the work table and spaced away from
7 the first side of the work table adjacent the axis of reciprocation and embracing the second end of the
8 saw blade to limit sideways displacement of the second end of the saw blade relative to the axis of
9 reciprocation while cutting the workpiece.

10
11 6. The table saw of claim 1, wherein the work table comprises:
12 a frame constructed of first and second parallel side rails secured to opposite ends of a
13 plurality of parallel cross members disposed therebetween, wherein first and second cross members
14 disposed at an intermediate position along the first and second side rails are spaced a predetermined
15 distance apart for receiving the mounting plate therebetween; and
16 the mounting plate having a top surface disposed in the plane of the first side of the work table
17 and supported between the first and second cross members, the mounting plate configured for
18 supporting the saw motor from the second side of the mounting plate.

19
20 7. The table saw of claim 6, wherein the work table further comprises:
21 first and second fence track rails disposed respectively along an outer side of the first and
22 second parallel side rails of the work table frame for receiving and guiding a table saw fence thereon;
23 and
24 a table saw fence having a first and a second end configured for sliding along and being
25 secured respectively to the first and second fence track rails and further having a head end equipped
26 with a clamping device for securing the first and second ends of the fence to the respective first and
27 second fence track rails.

1 8. The table saw of claim 1, wherein the work table includes a collapsible leg, pivotally
2 attached to each corner of the work table, the collapsible leg having an upper end and a lower end.
3

4 9. The work table of claim 8, wherein each collapsible leg pivots about a pin through a side
5 rail of the work table and a first end of a rigid brace, the rigid brace fixed at a second end at a
6 predetermined acute angle to a near side of the upper end of the collapsible leg, the collapsible leg
7 pivoting from a collapsed position against and along a lower side of the side rail of the work table to
8 an extended position extending downward and at an angle approximately 100 degrees from the
9 collapsed position, wherein the upper end of the collapsible leg is secured to the side rail in the
10 extended position by a pivoting, spring-biased latching pawl having a hooked end, the latching pawl
11 disposed within and the hooked end slightly protruding from the upper end of the collapsible leg,
12 when the upper end of the collapsible leg is moved toward and against the side rail into the extended
13 position, whereby the protruding, hooked end of the latching pawl is caused to enter a corresponding
14 opening in the lower side of the side rail of the work table and snap into a locked position under the
15 tension of a biasing spring that provides the spring bias to the latching pawl.
16

17 10. The table saw of claim 8, wherein the pivoting, spring-biased latching pawl is released
18 to allow collapse of the collapsible leg by rotating the latching pawl about its pivot against the spring
19 tension of the biasing spring to disengage the hooked end of the latching pawl from the corresponding
20 opening in the lower side of the side rail of the work table.
21

22 11. The table saw of claim 1, wherein the work table includes folding leg means attached to
23 the second side of the work table.
24

25 12. The table saw of claim 1, wherein the work table is adapted to being supported upon a
26 pair of sawhorses positioned beneath the second side of the work table.
27

28 13. The table saw of claim 1, wherein the work table further comprises a work surface
29 formed from a thin sheet of rigid material for covering the first side of the work table including the

1 mounting plate and having a blade opening formed therethrough that coincides with the blade opening
2 in the mounting plate, wherein the work surface is secured to the first and second side rails of the
3 work table with individual fasteners at a plurality of locations.

4
5 14. The table saw of claim 1, wherein the work table further comprises:
6 an array of mounting holes in the mounting plate and proximate the blade opening for
7 attaching a motor mount to the second side of the mounting plate.

8
9 15. The table saw of claim 14, wherein a first mounting hole defines a pivot point and the
10 remaining mounting holes depart from a circular shape to allow for adjustment of the motor mount
11 relative to the blade opening.

12
13 16. The table saw of claim 14, wherein the mounting holes are countersunk to receive flat
14 head or pan head screws for securing the motor mount to the mounting plate.

15
16 17. The table saw of claim 1, wherein the blade opening in the mounting plate is an elongated
17 slot dimensioned to freely receive an elongated saw blade therethrough.

18
19 18. The table saw of claim 1, wherein the first side of the work table defines an equivalent
20 plane area sufficient to support a workpiece at least four feet wide.

21
22 19. The table saw of claim 1, wherein the second side of the mounting plate includes a motor
23 mount receptacle and a cammed lever latch proximate the blade opening in the mounting plate for
24 securing a motor mount in snap-in fashion to the second side of the mounting plate without the use
25 of tools.

26
27 20. The table saw of claim 1, wherein the housing of the saw motor comprises mounting
28 means for attaching the saw motor to the second side of the mounting plate such that the elongated

1 saw blade clamped to the distal end of the reciprocating output shaft of the saw motor is aligned to
2 pass through the blade opening in the mounting plate.

3
4 21. The table saw of claim 1, wherein the reciprocating output shaft has a reciprocating
5 stroke of at least one-half inch

6
7 22. The table saw of claim 1, wherein the blade clamping means secures the first end of the
8 elongated blade to the distal end of the reciprocating output shaft of the saw motor.

9
10 23. The table saw of claim 1, wherein the blade clamping means secures the blade in a chuck
11 actuated by a lever mechanism.

12
13 24. The table saw of claim 1, wherein the blade clamping means secures the blade in a chuck
14 actuated by a rotating collar mechanism.

15
16 25. The table saw of claim 1, wherein the elongated blade comprises a length-to-width ratio
17 of at least ten-to-one and teeth adapted to cutting sheet metal and a foamed plastic material.

18
19 26. The table saw of claim 2, wherein the motor mount is secured to the mounting plate
20 using one or more machine screws.

21
22 27. The table saw of claim 2, wherein the motor mount is secured to the mounting plate
23 using a quick release mechanism.

24
25 28. The table saw of claim 27, wherein the quick release mechanism comprises:
26 a foot disposed on the second side of the mounting plate for receiving a corresponding shoe
27 portion of the motor mount;
28 a portion of the motor mount configured as a shoe for receiving the foot disposed on the
29 second side of the mounting plate proximate the blade opening;

1 a hand-operated locking device for securing the foot within the shoe portion of the motor
2 mount, the locking device selected from the group consisting of a cam lock, an over center lock, a
3 self-locking nut, a spring-biased lock and a thumb screw.

4
5 29. The table saw of claim 27, wherein the quick release mechanism comprises:
6 a portion of the motor mount configured as a foot for being retained within a shoe disposed
7 on the second side of the mounting plate proximate the blade opening;
8 a shoe disposed on the second side of the mounting plate for receiving the foot portion of the
9 motor mount; and
10 a hand-operated locking device for securing the foot portion of the motor mount within the
11 shoe, selected from the group consisting of a cam lock, an over center lock, a self-locking nut, a
12 spring-biased lock and a thumb screw.

13
14 30. The table saw of claim 2, wherein the motor mount is secured to the saw motor housing
15 using one or more machine screws.

16
17 31. The table saw of claim 2, wherein the motor mount comprises a box-like adapter, having
18 a first face and an opposing second face approximately parallel to the first face, wherein the first face
19 has a corresponding elongated blade opening therethrough and the second face has a corresponding
20 opening for passage of the reciprocating output shaft therethrough and wherein the first face is
21 adapted for attaching the motor mount to the second side of the mounting plate of the work table and
22 the second face is adapted to attaching to the saw motor housing such that the reciprocating blade
23 axis is disposed at a predetermined angle relative to the first side of the work table for cutting the
24 workpiece as the workpiece is moved past the elongated saw blade when the saw motor is attached
25 to the mounting plate via the motor mount.

26
27 32. The table saw of claim 31, wherein the motor mount is dimensioned to enclose the blade
28 clamping means between the first and second faces of the motor mount and further to allow for the

1 reciprocating motion of the blade clamping means attached to the distal end of the reciprocating
2 output shaft.

3
4 33. The table saw of claim 31, wherein the predetermined angle relative to the first side of
5 the work table is approximately four degrees from normal to the first side of the work table plus or
6 minus four degrees.

7
8 34. The table saw of claim 31, wherein the motor mount is a casting or a weldment fabricated
9 of a rigid, high-strength material.

10
11
12 35. The table saw of claim 5, wherein the blade guide is slidably supported on a support shaft
13 suspended from a cantilevered support arm attached to an edge of the work table and disposed to
14 one side of a path followed by the workpiece during sawing.

15
16 36. The table saw of claim 5, wherein the blade guide is slidably adjustable along a support
17 shaft disposed parallel to the reciprocating axis of the elongated blade, wherein the blade guide
18 remains in position relative to the elongated blade when the blade guide height is adjusted for different
19 thicknesses of the workpiece.

20
21 37. The table saw of claim 5, wherein the blade guide is supported from a blade-shaped
22 member attached to the work table, and disposed in the same plane as the elongated blade and
23 rearward of the elongated blade, such that the blade-shaped member occupies the saw kerf of the
24 workpiece during operation.

25
26 38. The table saw of claim 37, wherein the blade-shaped member attached to the work table
27 is disposed parallel to the reciprocating axis of the elongated blade, wherein the blade guide remains
28 in position relative to the elongated blade when the blade guide height is adjusted for different
29 thicknesses of the workpiece.

1 39. The table saw of claim 5, wherein the blade guide assembly comprises:
2 a rectangular guide block, having a first and second end and a vertical slot disposed at the
3 first end to receive a substantial portion of the width of the second end of the elongated saw blade
4 therein, wherein first and second side walls of the slot, being spaced apart approximately twice the
5 thickness of the elongated saw blade and substantially parallel thereto, limit the sideways displacement
6 of the elongated saw blade during a cutting operation on the workpiece; and
7 a U-shaped blade guide frame having first and second legs for supporting the rectangular
8 guide block therebetween, the rectangular guide block being retained on an adjustment axle passing
9 laterally through the first and second legs of the blade guide frame and through a threaded hole
10 disposed laterally through the rectangular guide block between the vertical slot and the second end
11 of the rectangular guide block, wherein the portion of the axle disposed between the first and second
12 legs of the blade guide frame is threaded such that rotation of the axle in either direction causes lateral
13 movement of the rectangular guide block to laterally center the elongated saw blade in the vertical
14 slot of the rectangular guide block.

15
16 40. The table saw of claim 39, wherein the rectangular guide block further comprises a self-
17 lubricating bearing surface disposed on each of the first and second side walls of the vertical slot.

18
19 41. The table saw of claim 40, wherein the self-lubricating bearing surface is provided by a
20 teflon face disposed in each of the first and second side walls of the vertical slot.

21
22 42. The table saw of claim 39, wherein the adjustment axle includes at least one end
23 configured to provide rotation of the axle in either direction in the blade guide frame for adjusting the
24 lateral position of the rectangular blade guide between the first and second legs of the blade guide
25 frame.

26
27 43. The table saw of claim 39, wherein the blade guide frame is adjustably supported on a
28 vertically oriented, cylindrical support shaft suspended, from a support member attached to the work
29 table, above the first side of the work table and proximate a rearward edge of the elongated blade,

1 wherein the blade guide frame is provided with vertical and polar angle adjustments to position the
2 rectangular guide block in a guiding relationship that receives the elongated saw blade within the
3 vertical slot and limits the sideways displacement of the elongated saw blade during a cutting
4 operation on the workpiece.

5
6 44. The table saw of claim 39, wherein the blade guide frame includes a bifurcated,
7 horizontally-disposed workpiece shoe extending from a lower surface of the blade guide frame to a
8 disposition on either side of and beyond the width of the elongated saw blade for holding downward
9 the workpiece against the first side of the worktable during a sawing operation.

10
11 45. The table saw of claim 5, wherein the blade guide assembly comprises a U-shaped body
12 having a throat and first and second legs enclosing the elongated blade proximate both sides thereof
13 between the first and second legs, a rearward edge of the elongated blade disposed in the throat of
14 the U-shaped body wherein first and second blade-guiding dowell pins disposed along a common axis
15 perpendicular to the elongated blade and passing laterally through the first and second legs of the
16 blade guide and in juxtaposition proximate each side of the elongated blade and wherein each dowell
17 pin is adjustably supported in one respective leg of the U-shaped body such that the elongated blade
18 passes between opposing faces of the first and second blade-guiding dowell pins to restrain the
19 elongated blade from being displaced sideways as the workpiece is being sawed.

20
21 46. The table saw of claim 45, wherein the blade guide further comprises a back stop bar
22 member disposed laterally across and within the throat of the U-shaped body to restrain the rearward
23 edge of the elongated blade from being displaced rearward as the workpiece is being sawed.

24
25 47. The table saw of claim 5, wherein the blade guide comprises a U-shaped body enclosing
26 the elongated blade at both sides and a rearward edge of the elongated blade, the U-shaped body
27 further including a bearing surface disposed within each side of the U-shaped body in juxtaposition
28 proximate each side of the elongated blade such that the elongated blade passes between opposing

1 faces of the bearing surface to restrain the elongated blade from being displaced sideways as the
2 workpiece is being sawed.

3